Title: Flicking Football Fun

Brief Overview:

Students will develop an understanding of the data analysis tools median, mode, and range through a series of data collection activities. Under the theme of football, students will collect and display data through a series of activities using paper footballs. Throughout the unit, they will display data in two types of graphs, stem and leaf plots and line plots. By the end of the unit, students will be able to construct and interpret both types of graphs in order to analyze data for median, mode, and range.

NCTM Content Standard:

1. Consider how data presentation affects the interpretation of data.
2. Collect data using experimentation.
3. Represent data using tables and graphs such as stem and leafs and scatter plots.

Grade/Level:

Fourth Grade

Duration/Length:

3 - 60 minute sessions plus a summative assessment

Student Outcomes:

Students will:

- Collect and organize data in order to graph data.
- Develop and interpret stem and leaf plots and line plots
- Analyze and interpret line plots and stem and leaf plots in order to find median, mode, and range.

Materials and Resources:

Day 1
   Resource Sheets:
- Preassessment: Number of Homeruns;
- Kids Have Pets-2formats;
- Tally Sheet Successful Attempts
- Miniature Footballs
- Number of Successful Field Goals
- What Makes A Good Line Plot?
- Passes
- Raven Games
- Raven Fans

- Paper footballs- use printer paper 8 ½ by 11.
- Internet access for paper football demonstration
- 1 yard stick or measuring tape per group
- Post-its marked with X's
- Marker

Day 2
    Resource Sheets:
- Vocabulary Cards
- Miniature Footballs
- Tally Sheet for Successful Attempts (from Day 1)
- Number of Successful Field Goals
- Figlioli's Field Goals
- High Temperatures…
- Paper footballs from previous lesson
- Marker
- Masking tape
- Highlighter
- Paper Footballs (from Day 1)

Day 3
    Resource Sheets:
- Flicking Frenzy
- Run Ray Run
- The Longest Yard
- Paper footballs from Day 1 lesson
- Sticky Notes for each student or miniature football cut-outs
- Vocabulary cards
- Measuring Tape for each student (60 inches).
- cm graph paper (re-teach)

    Per Group Materials (Engagement):
- 1roll of measuring Tape (approximately 100 inches in length).
- 1 Yard stick
- Masking tape

Day 4
- Summative Assessment

Development/Procedures:

Day 1

Pre-assessment

- Inform students that a pre-assessment will be given to show what they already know about their upcoming unit on data. Distribute the pre-assessment.
- Have students complete questions pertaining to median, mode, and range from a given line plot.
- Students demonstrate the use of median, mode, and range within the context of a line plot and explain how to find the mode of a given set of data.

Engagement
- Discuss the need to display information in easy and meaningful ways.
- Distribute two sets of the same information in two different ways (Pre-fold the paper so students can't see the information). It will be a race to answer the questions posed below.
- In a paragraph format, give a sample of class room pets of students **Kids Have Pets**. In a bar graph format, distribute out the same data of class room pets- **Kids Have Pets** . Verbally, ask given questions such as:

> *What pet was most popular among the class?*
> *How many students had a Guinea Pet as a pet?*
> *How many more dogs are there than birds?*
> *How many students have a fish?*

- Then, compare the two formats of information as a class. Show students that the paragraph format, gives the same information as the bar graph but the bar graph is quicker and easier to interpret. Use an ELMO or Overhead to show a side by side comparison of the information.
- The purpose is to emphasize that displaying data in a graph is easier to understand.

Exploration
- Students are presented with the exciting idea of collecting data using paper footballs.
- Model how to create paper footballs using the template provided. The link below shows a demonstration video.
  - http://www.youtube.com/watch?v=RTIwzFuczxw
- Students will work with partners in attempting to kick the football through goal post.
- Each student is given 10 attempts from 36 inches from the goal post. Each person is to collect their own data by keeping a tally of their successful attempts through the goal posts (See resource).
- After each pair is finished they are to give their data to you. Display their data randomly on the board for the class to observe.
- When students have finished they are arranged in groups of four. Ask the students to find the median, mode, and range of the data.

Explanation
- Pose the question:
  > *What is difficult about the way our results are displayed on the board?*
  > *(Answers may vary) Listen to student discussions for misconceptions*

on the meaning of the X's. Make note and use accordingly for differentiation.

- Introduce the vocabulary of a line plot as a new graph that display the data in a way that will be helpful in finding the median, mode, and range. This new graph will help us find the median, mode, and range of our data set from our paper football activity- **Number of Successful Field Goals** from 36 inches (*student/teacher resource*). Distribute it to the students.
- Use a display device (chalkboard, whiteboard, or Promethean) to create a line plot of the classes' data.
- Review the necessary parts of a line plot in the process: title, spacing and sizing of X's, and then the meaning of the X's (see discussion note below)

  - Create a title: **Number of Successful Field Goals by Students**
  - Draw a number line. Explain that it represents a part of an actual number line. No numbers should be skipped.
  - Begin by asking the students to find the lowest data number and the highest number displayed. This is necessary for determining the range of the line plot (Don't introduce the term at this point).
  - Cross out each piece of data as you complete the line plot. Make sure students follow this step in the process, and monitor accordingly.
  - *Discussion note: During the actual creation of the line plot with the class, stress the representation of the X as Students, where the number corresponds to Field Goals.*
    Once the line plot is complete, discuss how the data easily answers questions such as:
    - How many students kicked a certain number of field goals?
    - What number do you see occurs the most often?
    - Students may use a checklist found on Student Resource #3 as an aid.

Extension
- Students will complete a line plot from a given set of data-**Passes** (Student Resource Sheet). An answer key is provided.

Differentiation
- Reteach
  - Assist students needing re-teaching using **Raven Games** (Student Resource Sheet #3—What Makes a Good Line Plot?) by labeling what the X's represent and/or the number line scale.
- Enrich
  - Complete Ravens Games independently while also creating the actual number line from the given set of data. Upon completion, they may switch line plots with another student to check for accuracy.

Evaluation (Ongoing formative assessment for Day 1)
- Have students complete **Raven Fans** in order to demonstrate and use the skills of organizing data into a line plot when given a data set.

- Collect Student Footballs and collect **Tally Sheet** to use for Day 2.

Day 2

Engagement
- Have students collect data by kicking field goals from 48 inches long. Mark off 48 inches using the measuring tape and mark the spot for the goal posts using masking tape.
- With a partner, students will attempt to kick it through their goal posts 10 times. Each student records it on their **Tally Sheet** from yesterday's lesson.

Exploration
- As a class, create a new line plot with the new data from 48 inches.
- Explain to the students that they're going to use this data to create a human line plot to display the data from the engagement activity. Distribute **miniature footballs** to each student (Instead of X's for the line plot, they'll use miniature footballs).
- Using a marker, students write down the number for successful attempts on their football.
- Pick a location where students can get in order from least to greatest and have them order themselves in a line plot. Have the location marked with masking tape to help them organize themselves on the line plot.
  - *Hint*: Initially, they might get into a single file line, so have yesterday's line plot visible in the room.
  - *(Challenge suggestion: students must order themselves in the line plot without talking; it should take about a minute).*

Explanation
- Once students have created the line plot, inform them that we'll use this model to find range, mode, and the median.
  - *Note*: The order in which you find the range, mode, and the median is important! First-Range, Second-Mode, Third-Median
- As a class, find the range by identifying the least and greatest 'student values'.
- Create the line plot on the board (your display method is optional):
  - First, draw a line plot on the board and have the students stick their footballs accordingly. Then, show how the range is found by finding the difference of those two values.
    Important Note: These 2 students need to return to the human line plot.
  - Secondly, show how to identify the mode as simply the number with the most 'footballs'.
  - Thirdly, have them determine the median by counting the X's. Start counting from the lowest valued X while simultaneously counting down from the highest valued X until the middle X is located. Use two miniature footballs to illustrate this process on the board. Have a student volunteer assist counting up as you count down. Also,

> demonstrate how to do this on paper by circling X's from least to greatest while also circling them from greatest to least.
> *Note*: Incite them into see the procedure based on the definition of median (the middle number in an ordered set of data).

- Have them exit out of the line plot, one at a time, and place their footballs on a number line on the board (tape may be used to have them stick their footballs to the board).
- Emphasize that by counting up from the least value and counting down from the greatest value will help you find the middle number, the median. Students place the footballs on the board and return to their seats.
- Once completed and the 'median' student is identified, have that student place his/her football on the board and circle it.
- Discuss the vocabulary median, mode and range by reviewing **Vocabulary Definitions (See resource).**
- Review the steps once more for finding the range, mode, and median on the data set that is now visible on the board.
- Label the Median, Mode, and show the Range on the board (see example below)

			X	
	X		X	
	X	X	X	
X	X	X	X	X
2	**3**	**4**	**5**	**6**

| Range: 6 - 4 = 2 | | Median | | Mode |
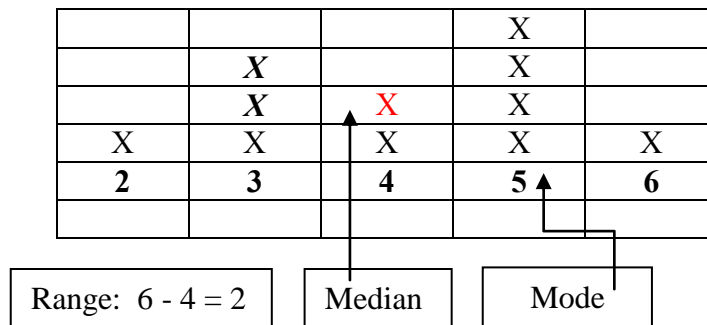
- Review the vocabulary definitions of clusters, gaps, and outliers. If there are no gaps, pretend by adding new data to create a gap and/or outlier in order to illustrate the concept.
- Distribute **Number of Successful Field Goals by Students.** Students will copy the class model from the board onto this line plot. Have students identify and label the median, mode, and range data on their paper as a model and reference to use as needed in the extension and/or re-teach exercises.

Extension
- Distribute **Figlioli's Field Goals**. Students will need to interpret a given line plot in order to correctly find the median, mode, and range. An answer key is provided.

Differentiation
- Reteach
  - Allow these students to use vocabulary cards, and also, limit the data set by covering up a section of the line plot. Include the outlier as they still need to use this number in the questions.

- Have them focus on finding the median by highlighting the data one at a time, until an obvious middle is found.

- Enrich
  - Students complete a BCR question asking them to analyze data and explain how it changes the line plot accordingly.

Evaluation (Ongoing formative assessment for Day 2)
- Students need to analyze data concerning high temperatures for July 1-29 in Baltimore.   They need to demonstrate their understanding of all the vocabulary words—**Evaluation Day #2**. An answer key is provided.

Day 3

Engagement
- The students will have the opportunity to kick their footballs as far as possible for this activity. This activity works best in pairs.
  - Tip*: Allow student to maximize space for this activity; a large floor space works best for it.*
- Have a predetermined line (use masking tape or measuring tape) for groups of students to kick their footballs. Each student will kick their footballs from the starting line. Measuring tape would be best to use. Two sets of tape might be needed to ensure ample length (approximately 120 inches).
  - Tip: *On hard surfaces have students mark the location of where the football lands, not where it stops.*
  - Tip: *Some methods for kicking the football travel farther than others. Demonstrate one method for all students to use in order to ensure consistency in the class data*
- Each student gets to kick at least once (if time permits a best of three kicks is ideal) and the student picks the best result.
- A yard stick may be needed to align the length the tape itself (anything long and straight will suffice for this purpose).
- Students record their 3 lengths on a sticky note and circle the longest kick. They can record the longest kick on a miniature football.

Exploration
- As a class, begin to create a line plot out of their exploration data. Have a couple students bring up their miniature football (may want to have them transfer the number to a sticky note if using a board) and post it to the board. Extend the number as needed.
    Remind them that they can't skip any numbers in a line plot.
- Stop them in the process when it becomes cumbersome to plot their data.
- Pose the question:
  - Is making of line plot from this data easier or harder than the line plots we've made in the past?
  What do you notice about the length of your line as you started to create it? How is it different from the line plot data we used before?

Explanation
- Help students to realize that the large range of data is the reason this line plot is more time consuming, or harder, to complete.
- Inform the students that if we can group the data a little differently, than we don't have to make a really long line plot, but will still show all the data we've collected.
- Distribute **Flicking Frenzy** to the students.
- Begin to plot the stem and leaf plot as a class by posing a question to find the smallest value. <u>Emphasize that the data needs to be plotted in order from least to greatest.</u> Pose a sample question: What is the lowest number on the board?
  > *Hint*: may want to have a student place them in order as other students bring them up on the board.)
- Take the lowest distance on the board first, and write the Tens digit under the Stem side only, and the Ones digit under the Leaf side only. Repeat again. Ask a student to do the next number, repeat for several numbers. After several examples pose the question:
  > "How are we organizing our data on this chart? "
- Guide the students to realize the purpose of the Stem side and the Leaf side without giving them the exact method of plotting the digits.
  - The digit on the left side represents the tens place.
  - The digit on the right side represents the ones place. Students must order the data from least to greatest.
- Finish compiling all the data on the board.
- Find the Median Mode and Range of the data set
  - Allow students to work in groups to determine these values
  - Review as a class. Review techniques for them as needed. It is important to find the median by counting from up from least to greatest, and while also counting from greatest to least.
    - Tip: *It helps to underline each leaf digit as you count until the median is located.*

Extension (Students apply/practice the learning.)
- Have students independently complete **Run Ray Run.** An answer sheet is provided.

Differentiation
- Reteach
  - Use centimeter graph paper as an aid for struggling students, based on part A of the resource sheet—**Run Ray Run**. Have these students use cm graph paper to draw a stem & leaf plot. These students will only complete part A of **Run Ray Run.**

- Enrich
  - Have students complete **The Longest Yard (Part III).** Students are asked to use what they know about place value in order to show how the stem &leaf plot will change given more data.

Evaluation (Ongoing formative assessment for Day 3)

- Distribute **Stem & Leaf Evaluation** in order for students to demonstrate their understanding of interpreting and constructing stem and leaf plots. An answer key is provided.

Day 4

Summative Assessment

- Distribute the Summative Assessment in order for student's to demonstrate their understanding of all the student outcomes

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Pre-Assessment

*Use the data below to answer the questions that follow.

<u>Number of Homeruns Hit by the Twins and Tigers</u>

```
                     X
         X           X           X           X
         X           X           X           X
X        X           X           X           X           X           X
X        X           X           X           X           X           X
_____
2        3           4           5           6           7           8
```

Number of Homeruns
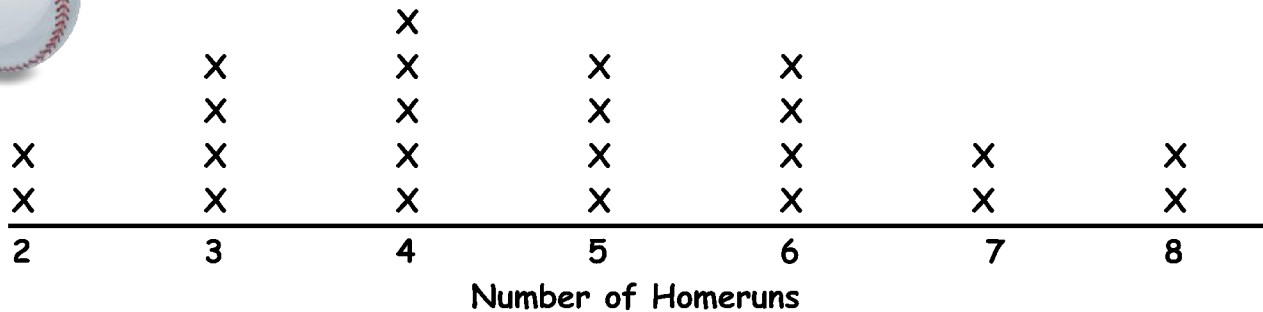
1. What is the median of the data? _____

2. What is the range? (Show your work.) _____

3. How many players hit 5 or more homeruns? _____

STEP A: What is the mode of the data?
_____

STEP B:
Explain why your answer is correct.
Use what you know about line plots and mode in your explanation.
Use words, numbers, and/or symbols in your explanation.

_____

_____

_____

_____

_____

Pre-Assessment

*Use the data below to answer the questions that follow.
Number of Homeruns Hit by the Twins and Tigers

```
                          X
            X             X             X             X
            X             X             X             X
X           X             X             X             X             X             X
X           X             X             X             X             X             X
_____
2           3             4             5             6             7             8
```
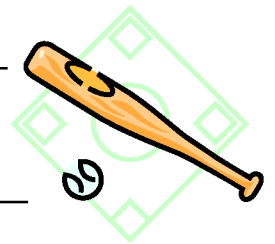Number of Homeruns
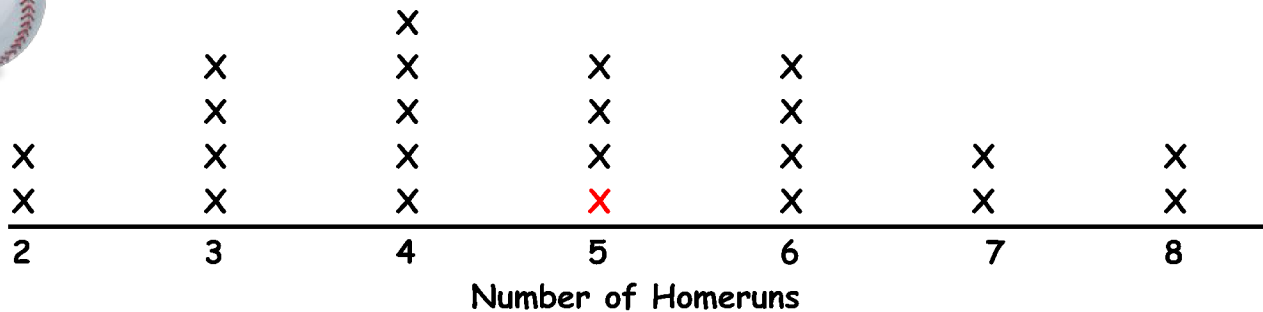
1. What is the median of the data? **5**

2. What is the range? (Show your work.) **8-2 = 6**

3. How many players hit 5 or more homeruns? **12 players**
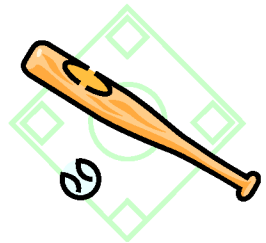
STEP A: What is the mode of the data?
        The mode is 4 homeruns

STEP B:
Explain why your answer is correct.
Use what you know about line plots and mode in your explanation.
Use words, numbers, and/or symbols in your explanation.

The mode is the number (datum) that occurs the most in a data set. The number 4

represents the mode because 5 players hit 4 homeruns. There are more players

that hit 4 homeruns (5) than any other number of homeruns.

Kids Have Pets

Mr. Sands asked his students what kind of pets they had at home. Below is the information that was gathered:

The number of students that have fish and birds are the same. There are 4 students who have fish. There are thirteen students who have dogs. The number of students that have cats is two more than the number of students who have dogs. The number of students who have a guinea pig is two less than the number of students who have birds.
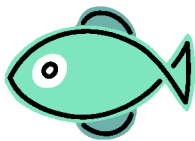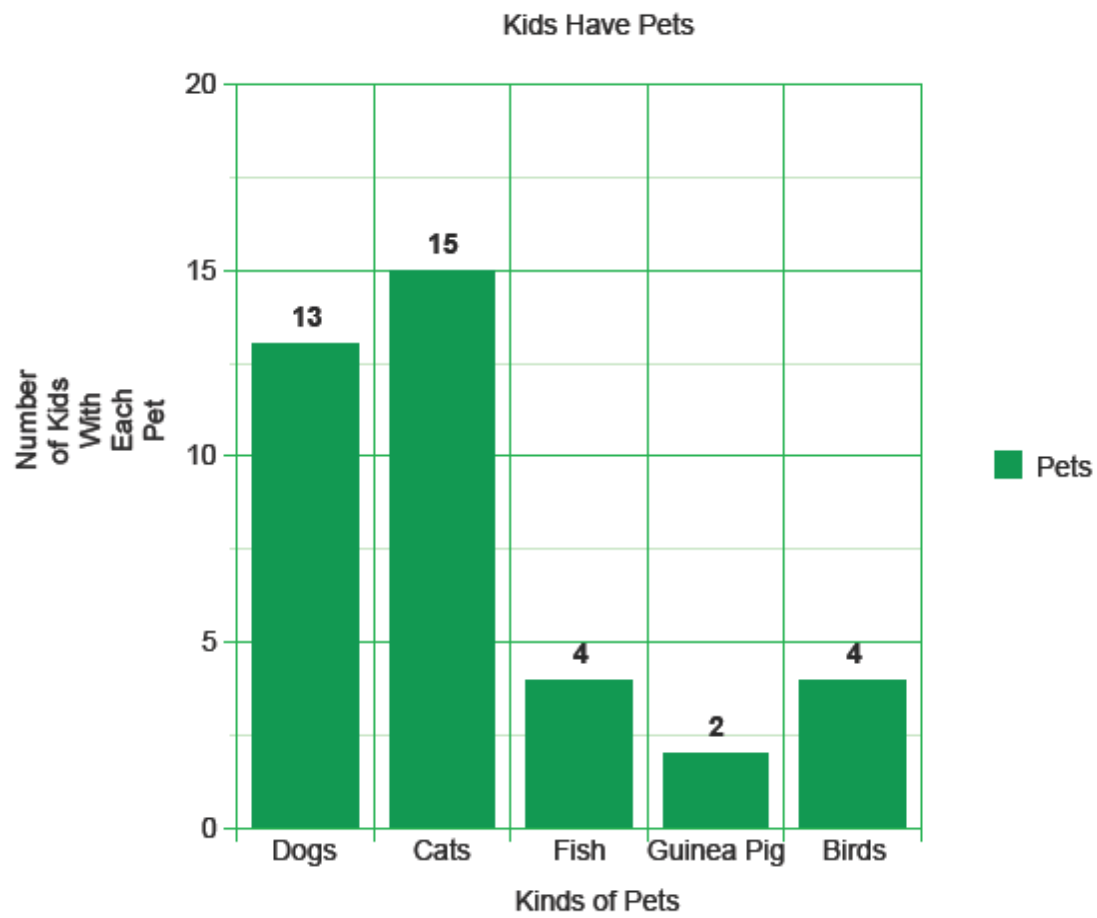
Kids Have Pets

Bar chart titled "Kids Have Pets" showing the Number of Kids With Each Pet by Kinds of Pets:
- Dogs: 13
- Cats: 15
- Fish: 4
- Guinea Pig: 2
- Birds: 4

Legend: Pets

Tally Sheet for Successful Attempts

Distance	Tally	Total
36 Inches		
48 Inches		

Tally Sheet for Successful Attempts

Distance	Tally	Total
36 Inches		
48 Inches		

Tally Sheet for Successful Attempts

Distance	Tally	Total
36 Inches		
48 Inches		

Miniature Footballs Resource

Number of Successful Field Goals by Students

0   1   2   3   4   5   6   7   8   9   10

Number of Field Goals from 36 Inches

What Makes A Good Line Plot?

Make sure you don't forget:
- A title
- Equal spacing between the numbers
- X's or marks that are the same size
- Every piece of data

Passes

*Complete the line plot by using the data below in the chart.
The data below shows the number of passes thrown in each game by Joe Flacco.

23	30	19	22	25	25	29	~~30~~
25	~~19~~	21	23	24	28	29	25

_____

X											X

19   20   27   30
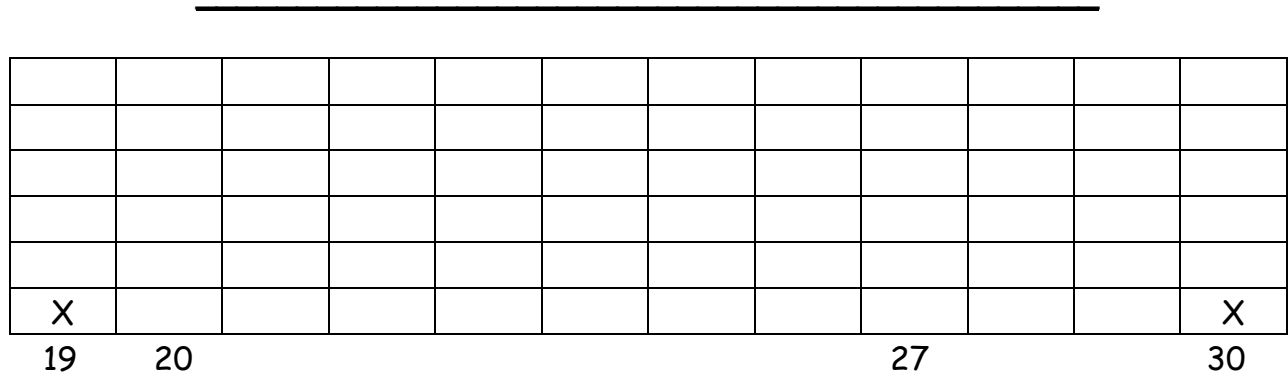
Did you use your checklist?

Passes

*Complete the line plot by using the data below in the chart.

The data below shows the number of passes thrown in each game by Joe Flacco.

23	30	19	22	25	25	29	~~30~~
25	~~19~~	21	23	24	28	29	25

Number of Passes Thrown in a Game   by Joe Flacco

						X					
						X					
X				X		X				X	X
X		X	X	X	X	X			X	X	X
19	20	21	22	23	24	25	26	27	28	29	30

Number of Passes

**Did you use your checklist?

<u>Raven Games</u>

Plot the information given below from the data chart. The data shows how many Raven games the students went to last year. Be sure to include all of the parts of a line plot.

0	1	6	5	6	0	0	0	2	11
12	7	6	4	3	2	1	1	0	0

```
_____
 0    1    2    3    4    5    6    7    8    9    10   11   12
```

Raven Games

Plot the information given below from the data chart. The data shows how many Raven games the students went to last year. Be sure to include all of the parts of a line plot.

0	1	6	5	6	0	0	0	2	11
12	7	6	4	3	2	1	1	0	0

Raven Games

Plot the information given below from the data chart. The data shows how many Raven games the students went to last year. Be sure to include all of the parts of a line plot.

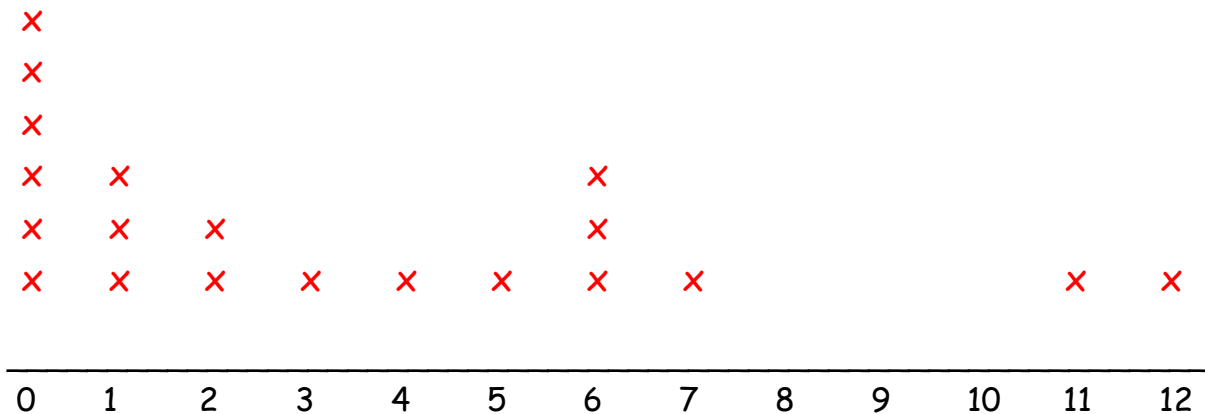| 0	1	6	5	6	0	0	0	2	11
12	7	6	4	3	2	1	1	0	0

_____

<u>Raven Games</u>

Plot the information given below from the data chart. The data shows how many Raven games the students went to last year. Be sure to include all of the parts of a line plot.

0	1	6	5	6	0	0	0	2	11
12	7	6	4	3	2	1	1	0	0

Ravens Fans

Use the data below to complete a line plot. This data shows the number of students in each class that likes the Ravens. Be sure to include all the necessary information for a line plot.

12	15	8	8	9	9	10	17	16	11	20
13	14	13	13	15	17	17	17	12	11	20

_____
8   9   10   11   12   13   14   15   16   17   18   19   20

What number occurs the most? _____

How many classes have more than 15 students that like the Ravens? _____

Ravens Fans

Use the data below to complete a line plot. This data shows the number of students in each class that likes the Ravens. Be sure to include all the necessary information.

12	15	8	8	9	9	10	17	16	11	20
13	14	13	13	15	17	17	17	12	11	20
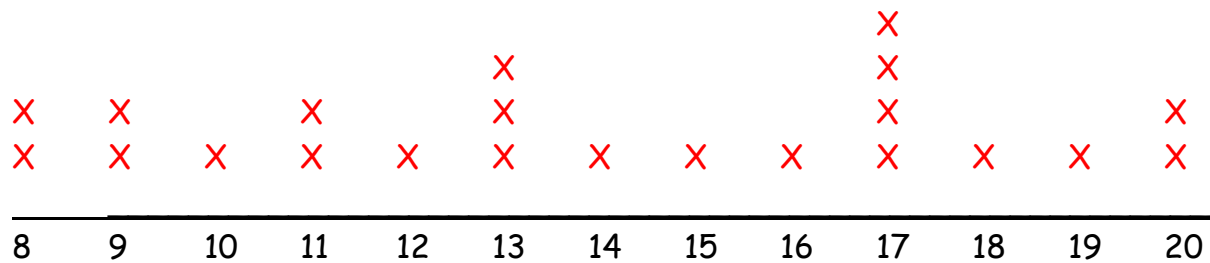
What number occurs the most? 17

How many classes have more than 15 students that like the Ravens? 9

Number of Successful Field Goals by Students
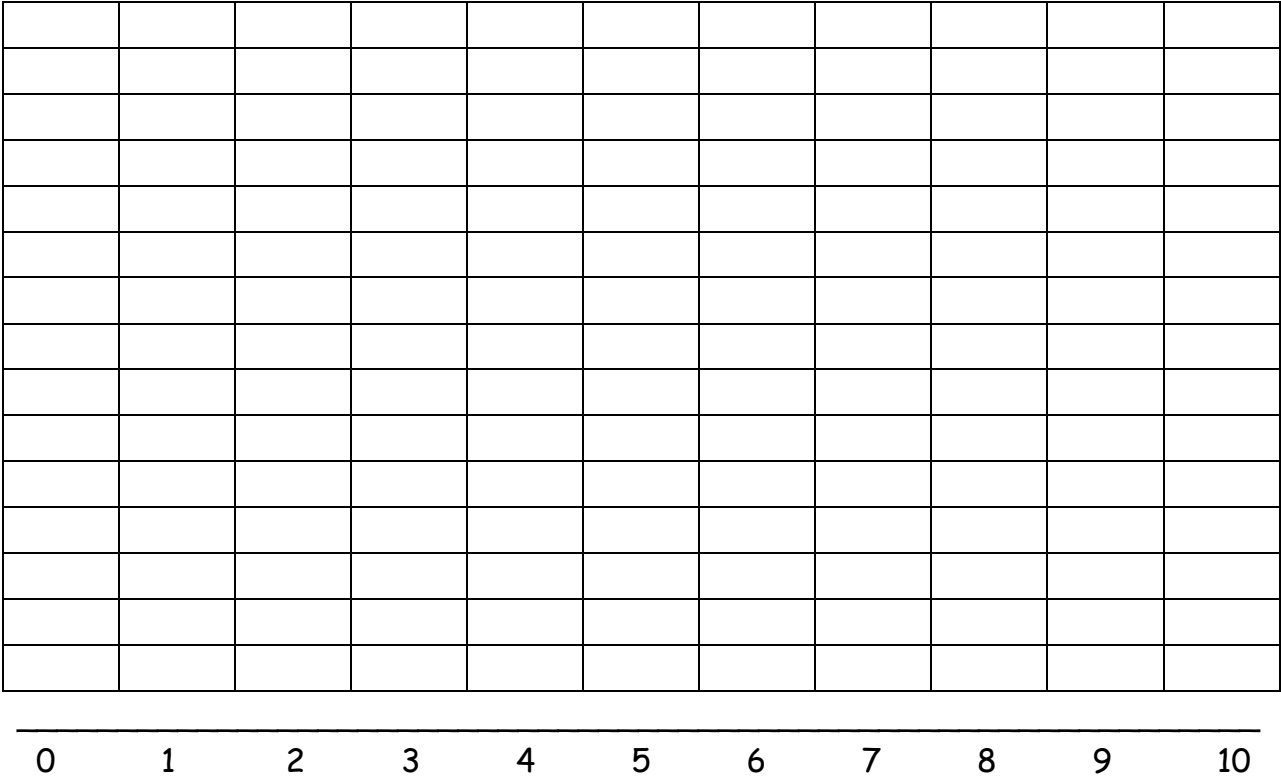
0   1   2   3   4   5   6   7   8   9   10

Number of Field Goals from 48 Inches

1. **What is the range of the data?** _____

    Explain how you solved the problem.

    _____

    _____

    _____

2. **Which is the mode?** _____ **How do you know?**

    _____

    _____

    _____

3. **What number is the median?** _____

Number of Successful Field Goals by Students

0   1   2   3   4   5   6   7   8   9   10

Number of Field Goals from 48 Inches

1. What is the range of the data? _____

   Explain how you solved the problem.

   _____

   _____

   _____

2. Which is the mode? _____ How do you know?

   _____

   _____

   _____

3. What number is the median? _____

Line Plot
Range
Outlier
Cluster
Gap

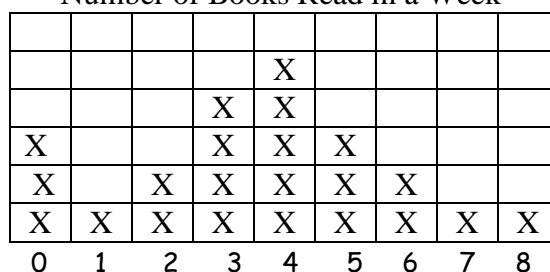| Median |
| Mode |

Line Plot

a graph that organizes a small range of data on a number line segment.

Number of Books Read in a Week

				X				
			X	X				
X			X	X	X			
X		X	X	X	X	X		
X	X	X	X	X	X	X	X	X

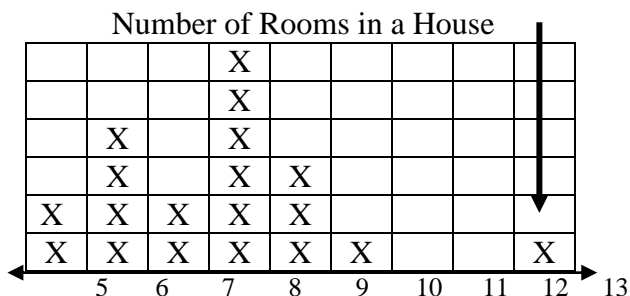0　1　2　3　4　5　6　7　8

Range

the difference between the greatest value and the least value in a data set

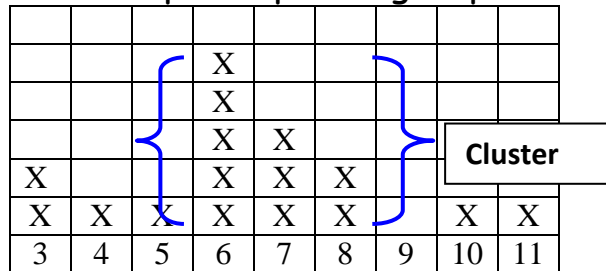**<u>23</u>**　16　17　9　15　**<u>8</u>**　16

range: 23 – 8 = 15

Outlier

a number in a data set that is very different from the rest of the numbers

Number of Rooms in a House

			X					
			X					
	X		X					
	X		X	X				
X	X	X	X	X				
X	X	X	X	X	X			X

5　6　7　8　9　10　11　12　13

Cluster

Areas where data piles up over groups of numbers.

			X					
			X					
			X	X				
X			X	X	X			
X	X	X	X	X	X		X	X
3	4	5	6	7	8	9	10	11

Cluster

Gap

Spaces between clusters.

			X					
			X					
	X		X					
	X		X	X				
X	X	X	X	X		Gap		
X	X	X	X	X	X			X
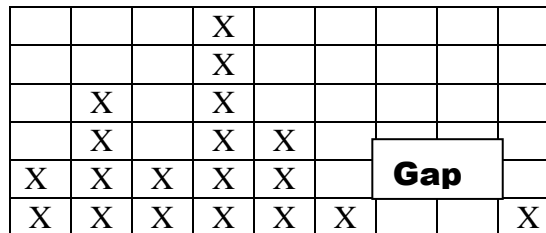
Median

the middle number in an ordered data set

9   12   (18)   21   25

Mode

the number or numbers that occur most often in a data set

6   **<u>4</u>**   7   **<u>4</u>**   10   11   **<u>4</u>**   6   **<u>4</u>**

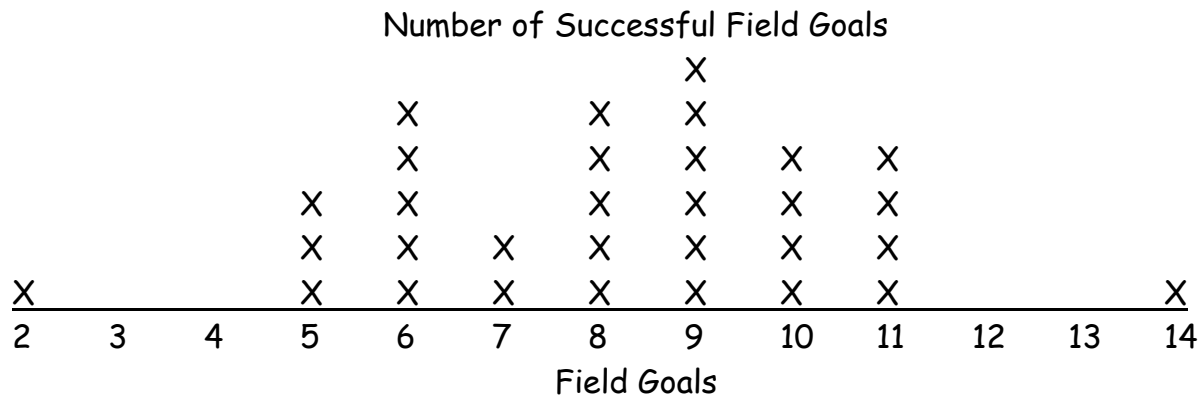mode = 4

Figlioli's Field Goals

Mr. Figlioli's class also did the same activity we just completed. They took 15 attempts instead of ten. Answer the questions that follow the line plot.

Number of Successful Field Goals

```
                                  X
                X           X     X
                X           X     X     X     X
          X     X           X     X     X     X
          X     X     X     X     X     X     X
X               X     X     X     X     X     X                       X
2     3     4     5     6     7     8     9     10    11    12    13    14
```
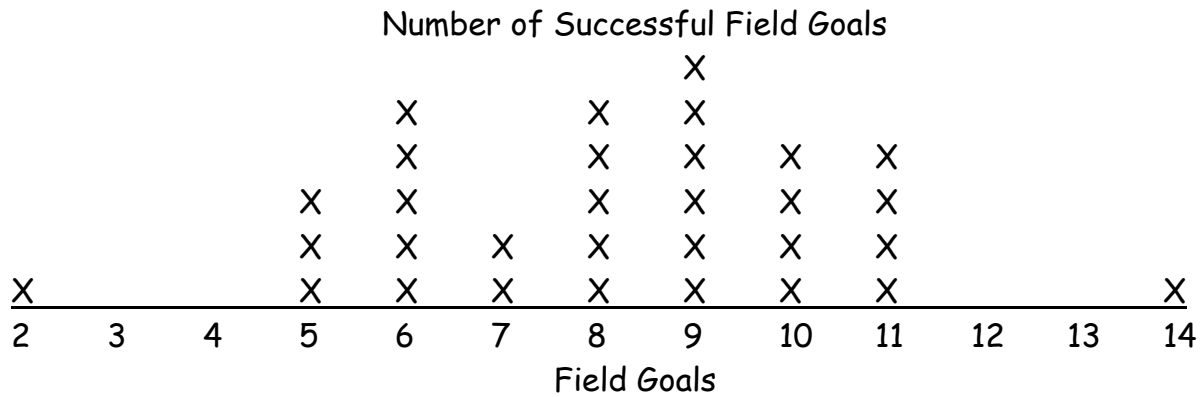
Field Goals

1. What is the mode of the data? _____

2. What is the range? _____

3. Are there any gaps? If so, where? _____

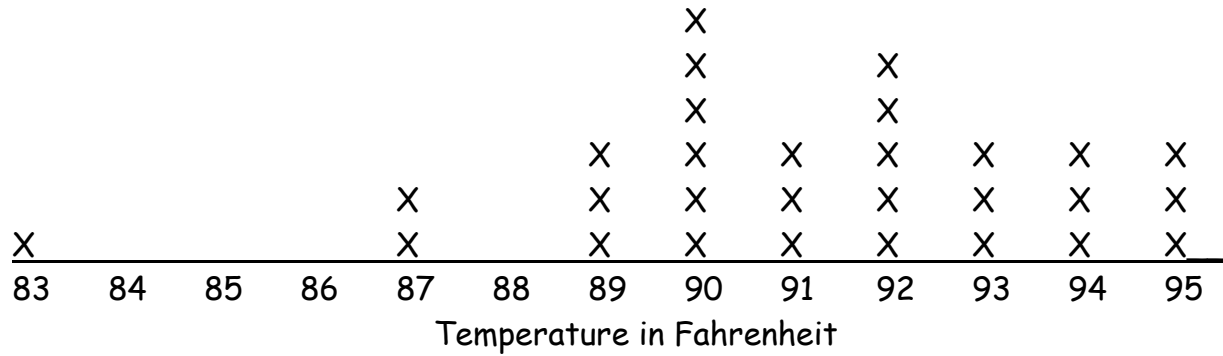4. What is the median of the data? _____

Figlioli's Field Goals

Mr. Figlioli's class also did the same activity we just completed. They took 15 attempts instead of ten. Answer the questions that follow the line plot.

Number of Successful Field Goals

```
                                    X
                  X           X     X
                  X           X  X  X  X
            X     X           X  X  X  X
            X     X     X     X  X  X  X
X                 X  X  X     X  X  X  X                          X
────────────────────────────────────────────────────────────────
2     3     4     5  6  7     8  9  10 11    12    13    14
```

Field Goals

1. What is the mode of the data? 9

2. What is the range? 14 – 2 = 12

3. Are there any gaps? If so, where? 2-5, 11-14

4. What is the median of the data? 8

High Temperatures for July 1- 29 in Baltimore

```
                              X
                              X              X
                              X              X
                       X      X   X   X      X   X   X   X
                  X           X   X   X      X   X   X   X
X_____X_____X___X___X_____X___X___X___X__
83   84   85   86   87   88   89   90   91   92   93   94   95
                    Temperature in Fahrenheit
```

1. What is the mode of the data? _____

2. What is the range? _____

3. Are there any gaps? If so, where? _____

4. What is the median of the data? _____

5. Are there any outliers? If so, where? _____

Step A: The high temperature for the 30th and 31st were 94 degrees. Add them to the line plot.
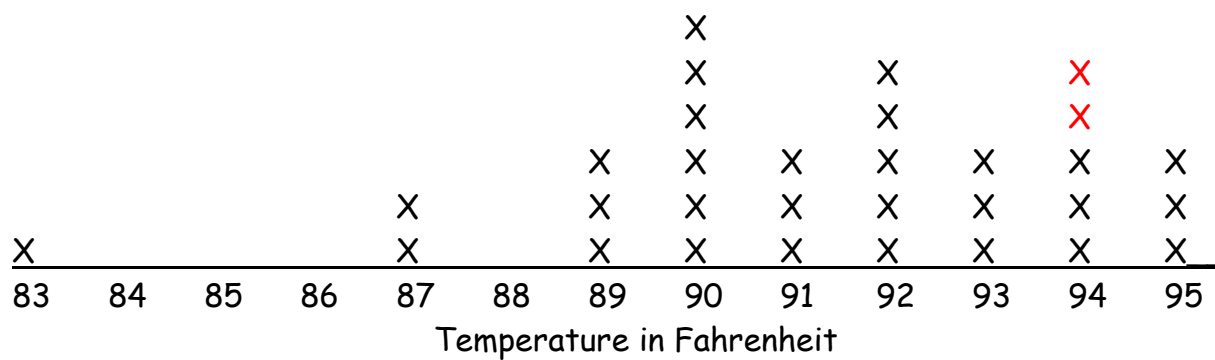

Step B: Did the median change? _____ If so, what is the new median? _____

Explain why your answer is correct.

Use what you know about line plots and median in your explanation.

Use words, numbers, and/or symbols in your explanation.

_____

_____

_____

_____

_____

High Temperatures for July 1- 29 in Baltimore

```
                              X
                              X           X           X
                              X           X           X
                        X     X     X     X     X     X     X
                  X     X     X     X     X     X     X     X
X                 X     X     X     X     X     X     X     X
_____
83    84    85    86    87    88    89    90    91    92    93    94    95
```

Temperature in Fahrenheit

1. What is the mode of the data? 90

2. What is the range? 95 – 83 = 12

3. Are there any gaps? If so, where? 83-87

4. What is the median of the data? 92

5. Are there any outliers? If so, where? Yes, 83

Step A: The high temperature for the 30th and 31st were 94 degrees. Add them to the line plot.

Step B: Did the median change? Yes

 If so, what is the new median? 92

Explain why your answer is correct.

Use what you know about line plots and median in your explanation.

Use words, numbers, and/or symbols in your explanation.

- The median was 92. When 2 more pieces of data was added, 92 remains the median because that is the middle number.

- There was a total of 29 days which made the 15th number the middle. Adding two more made the 16th number the median.

<u>Flicking Frenzy</u>
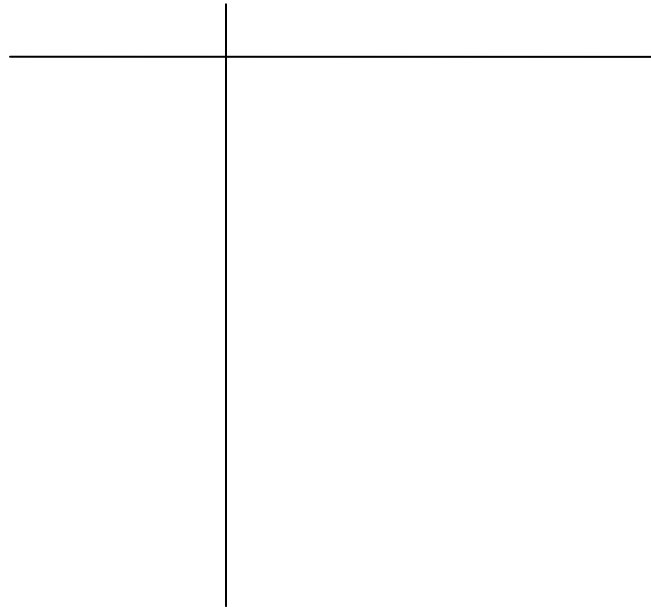
<u>Why do we use a stem and leaf instead of a line plot for this data?</u>
We would use a stem and leaf plot when the data has a wide/large range. A line plot is better used when we have a smaller range of data.
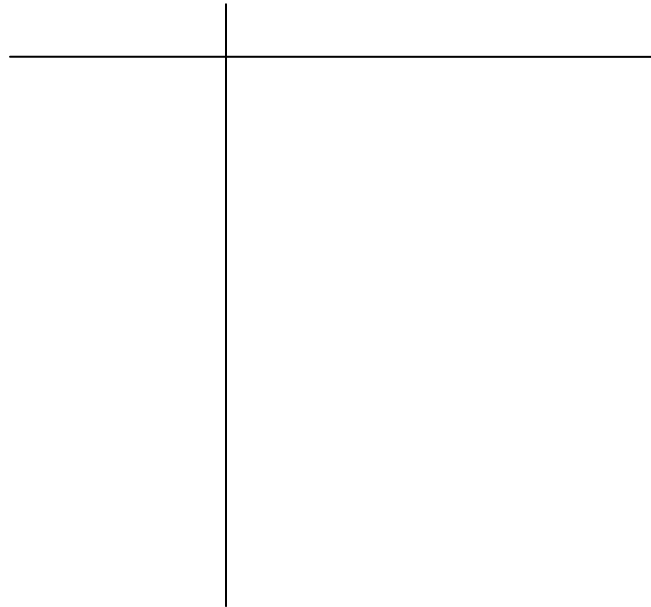
The left side represents the tens and the right side represents the ones. For example 4|6 = 46.

The mode = _____.
The range = _____.
The median = _____.

Flicking Frenzy

<u>Why do we use a stem and leaf instead of a line plot for this data?</u>
We would use a stem and leaf plot when the data has a wide/large range. A line plot is better used when we have a smaller range of data.

The left side represents the tens and the right side represents the ones. For example 4|6 = 46.

The mode = _____.
The range = _____.
The median = _____.

Run Ray Run!!!!

**Circle the set of data that you would use in a stem and leaf plot.

Set A:
Yards Gained by Ray Rice in Each Game

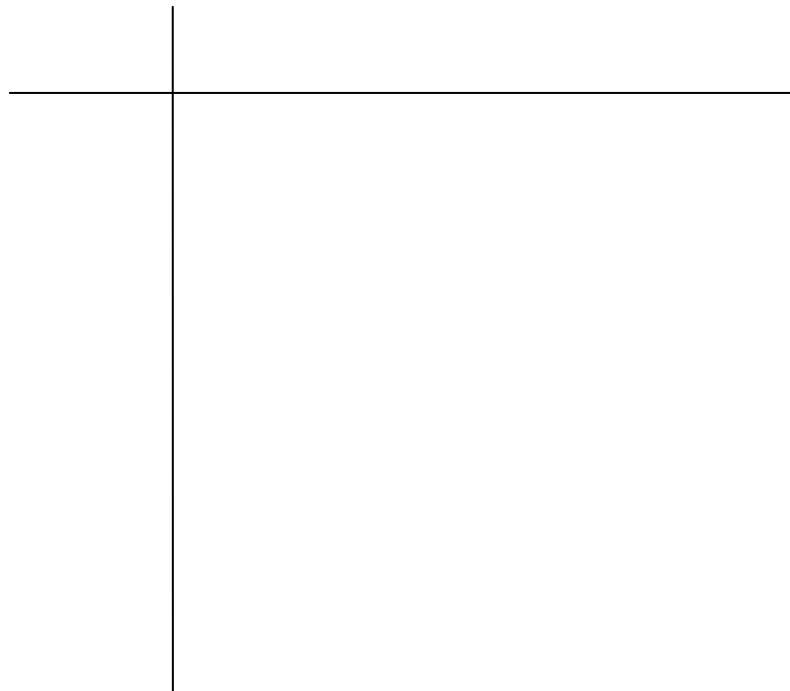45, 79, 99, 88, 79, 97, 98, 96, 98, 55, 40, 80, 75, 97, 98

Set B:
Number of touchdowns by the Ravens

2, 4, 5, 2, 1, 0, 3, 4, 2, 3, 3, 3, 2, 5, 4, 2

Explain why did you choose this set of data?

_____

_____

_____

_____

Directions: Construct a Stem and Leaf plot with the correct data set of data.

What is the mode, median, and range of this data?
Mode: _____
Median : _____
Range: _____

Step A: Ray Rice rushed for 125 yards in his last game. Add this new data to the stem and leaf plot on the previous page.

Step B:
Explain why your answer is correct.
Use what you know about place value and stem & leaf plots in your explanation.
Use words, numbers, and/or symbols in your explanation.

_____

_____

_____

_____

Run Ray Run!!!!

**Circle the set of data that you would use in a stem and leaf plot.

Set A:

Yards Gained by Ray Rice in Each Game:

45, 79, 99, 88, 79, 97, 98, 96, 98, 55, 40, 80, 75, 97, 98

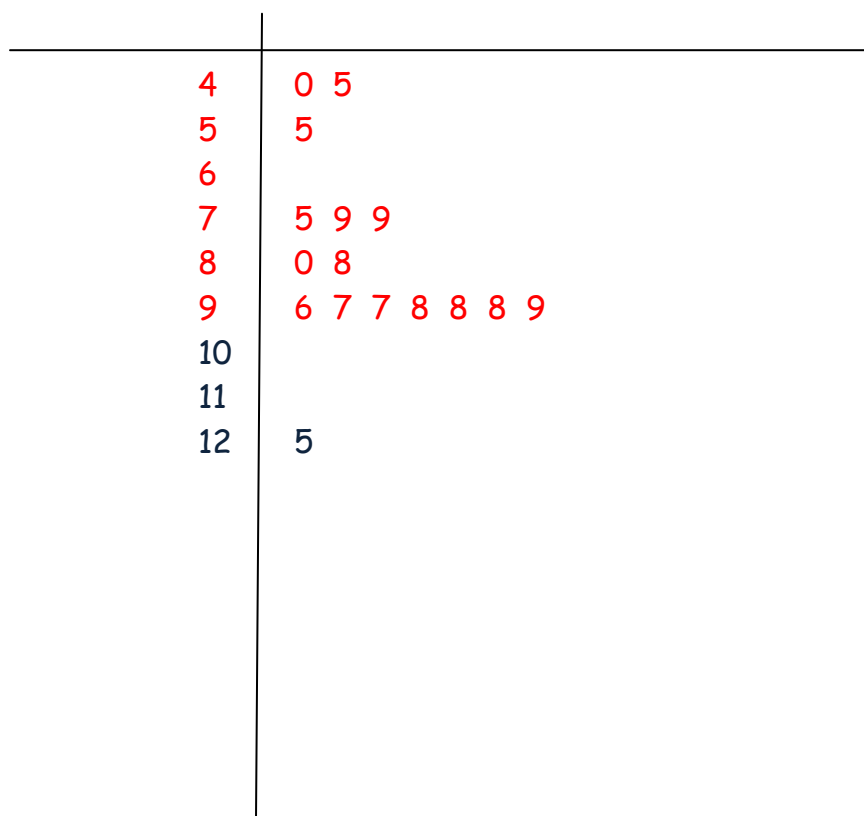Set B.

Number of touchdowns by the Ravens:

2, 4, 5, 2, 1, 0, 3, 4, 2, 3, 3, 3, 2, 5, 4, 2

Why did you choose this set of data?

The first set of data (Choice A), has a large range of data. A stem and leaf plot is to be used with a large range. A line plot is more appropriate with a set of data that has a minimal set of data.

***Construct a Stem and Leaf plot with this data.

40, 45, 55, 75, 79, 79, 80, 88, 96, 97, 97, 98, 98, 98, 99

```
      4  | 0 5
      5  | 5
      6  |
      7  | 5 9 9
      8  | 0 8
      9  | 6 7 7 8 8 8 9
     10  |
     11  |
     12  | 5
```

KEY: 7 | 5 = 75

What is the mode, median, and range of this data?
Mode: 98
Median : 88
Range: 99 - 40 = 59

Step A: What if Ray Rice rushed for 125 yards in his last game. Add this to the stem and leaf plot on the previous page.

Step B:
Explain why your answer is correct.
Use what you know about place value and stem and leaf plots in your explanation.
Use words, numbers, and/or symbols in your explanation.

- **125 has 12 tens and 5 ones. The left side of the plot is the tens and the right side is the ones. I added 10 tens, 11 tens, and 12 tens.**

- **There are no ones to go with 10 tens and 11 tens. The 5 ones is put in the same row as 12 tens.**

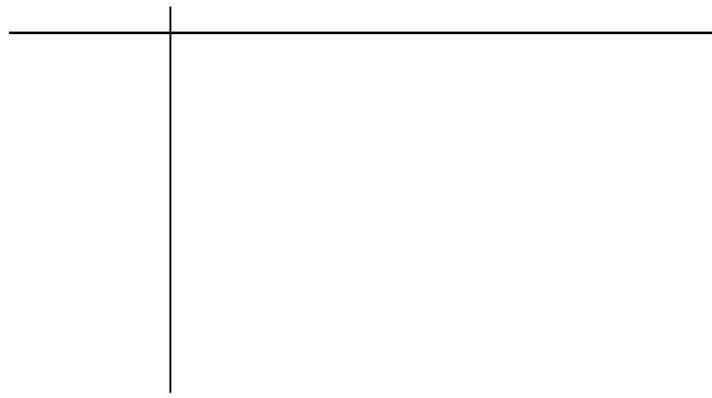- **So, 12 tens and 5 ones is equivalent to 125.**

The Longest Yard

The Raven's kicker, Billy Cundiff, had a great season in his success of field goal attempts. The data below represents the distances of some of his field goals over the season.

Part I: Use data below to construct a stem & leaf plot.

Billy's Field Goals

20, 25, 27, 35, 49, 20, 48, 20, 42, 36, 42, 36, 30

Part II: Interpret the data above to answer the following questions. Make sure to label your answers.

1. From what distance did Billy kick the most field goals?

   _____

2. What is the median distance Billy kicked from?

   _____

3. Find the range of Billy's field goals? _____

Part III: In the playoffs, Billy kicked two more field goals from 49 and 61 yards. Include the new data into the stem and leaf plot above. Use a colored pen or pencil to show the new data.

The Longest Yard

The Raven's kicker, Billy Cundiff, had a great season in his success of field goal attempts. The data below represents the distances of some of his field goals over the season.

<u>Part</u> I: Use data below to construct a stem & leaf plot.

Billy's Field Goals

20, 25, 27, 35, 49, 20, 48, 20, 42, 36, 42, 36, 30

2	0 0 0 5 7
3	0 5 6 6
4	2 2 8 9 9
5	
6	1

<u>KEY:</u>   3 | 5 = 35

<u>Part</u> II: Interpret the data above to answer the following questions. Make sure to label your answers.
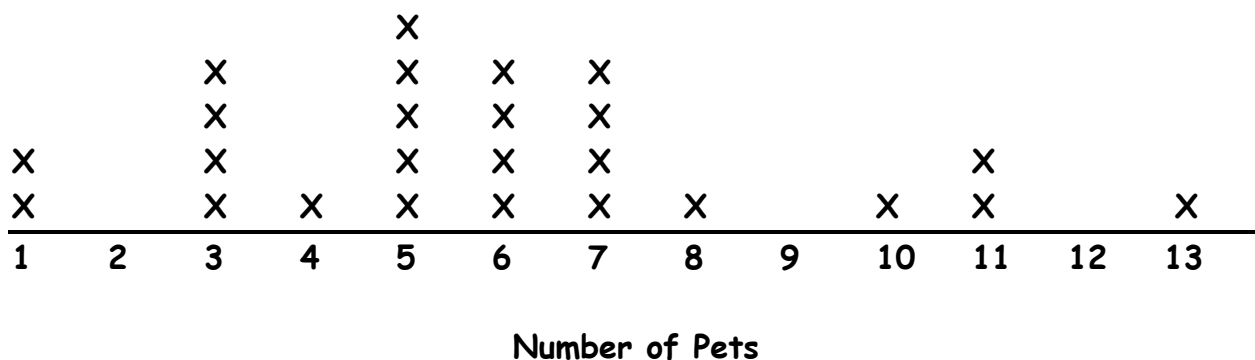
1. From what distance did Billy kick the most field goals? 30

2. What is the median distance Billy kicked from? 35

3. Find the range of Billy's field goals? 49 - 20 = 29

<u>Part</u> III: In the playoffs, Billy kicked two more field goals from 49 and 61 yards. Include the new data into the stem and leaf plot above. <u>Use a colored pen or pencil to show the new data.</u>

Assessment

*Use the data below to answer the questions that follow.

Number of Pets Owned by Students

```
                          X
            X             X    X    X
            X             X    X    X
  X         X             X    X    X                        X
  X         X    X        X    X    X    X         X    X              X
  ─────────────────────────────────────────────────────────────────────
  1    2    3    4    5    6    7    8    9    10   11   12   13
```

Number of Pets

1. What is the median of the data? _____

2. What is the range? (Show your work.) _____

3. How many students have at least 5 pets? _____

4.)

STEP A: The teacher forgot to add two students to the data. There were two more students with 7 pets. Add that data to the line plot.

STEP B: Did the mode change after adding the new data? _____
Explain why your answer is correct.
Use what you know about line plots and mode in your explanation.
Use words, numbers, and/or symbols in your explanation.

_____

_____

_____

_____

5.) Directions: Circle the set of data that you would use in a stem and leaf plot.

   A. Candy Bars Sold in Each Class

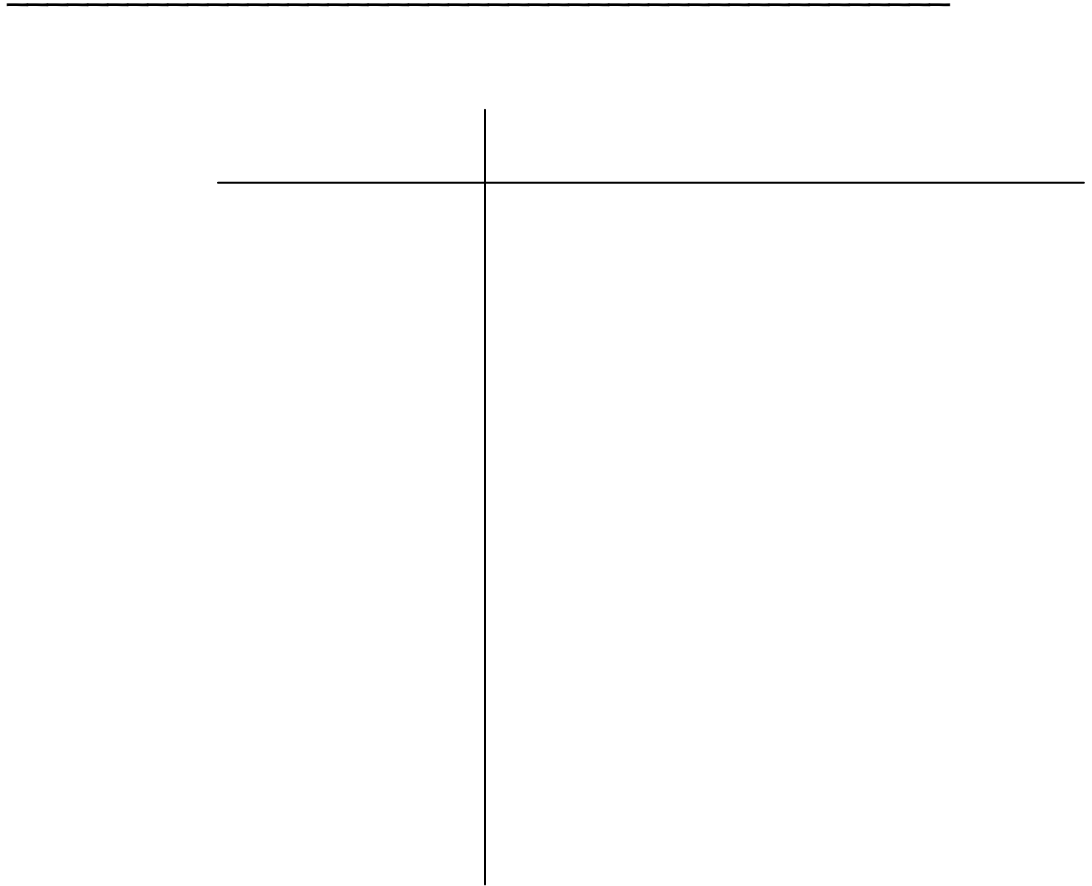   19, 45, 78, 34, 22, 59, 68, 78, 65, 59, 33

   B. Number of Students Absent :

       2, 4, 5, 2, 1, 0, 3, 4, 2, 5, 4, 2

Explain why did you choose this set of data?

_____

_____

_____

_____

6.) Construct a stem and leaf plot with this data from choice A above.

Title:

_____

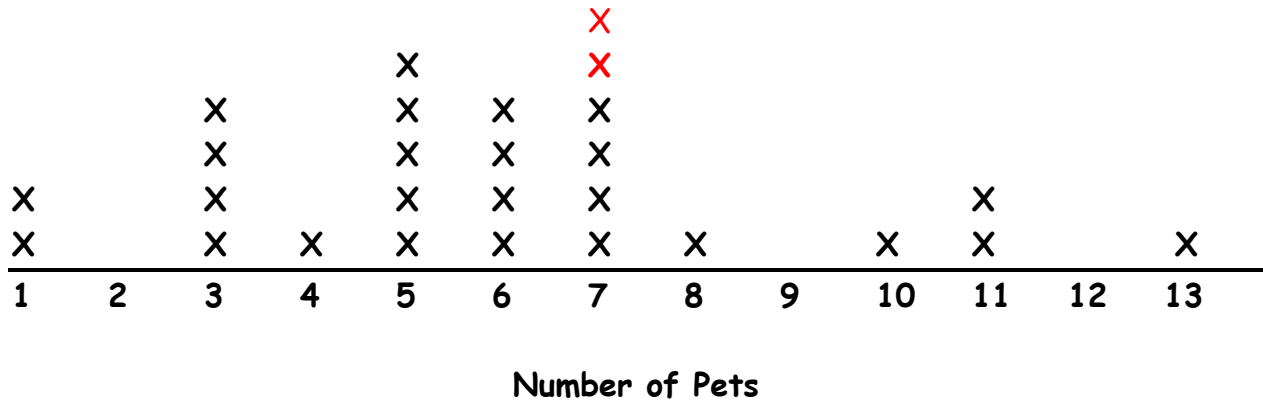What is the mode, median, and range of this data?

Mode: _____

Median : _____

Range: _____

*Use the data below to answer the questions that follow.

Number of Pets Owned by Students

```
                              X
                    X         X
          X         X    X    X
          X         X    X    X
X         X         X    X    X                   X
X         X    X    X    X    X    X         X    X              X
1    2    3    4    5    6    7    8    9    10   11   12   13
```

Number of Pets

1. What is the median of the data? **6**

2. What is the range? (Show your work.) **13 - 1 = 12**

3. How many students have 5 or more pets? **18 (red x's are not included at this point)**

STEP A: The teacher forgot to add two students to the data. There were two more students with 7 pets. Add that data to the line plot.

STEP B: Did the mode change after adding the new data?   No
Explain why your answer is correct.
Use what you know about line plots and mode in your explanation.
Use words, numbers, and/or symbols in your explanation.

- **The mode is the data that occurs most often. Before we added the new data, 5 was the mode.**

- **7 is the new mode because 6 students own 7 pets whereas 5 students own 5 students.**

- **So, 7 is the new mode for this data set.**

**Circle the set of data that you would use in a stem and leaf plot.
   A. Candy Bars Sold in Each Class

19, 45, 78, 34, 22, 59, 68, 78, 65, 59, 33
   B.   Number of Students Absent :

2, 4, 5, 2, 1, 0, 3, 4, 2, 5, 4, 2

Why did you choose this set of data?
- I chose the data in A to use in a Stem and Leaf plot.

- This data is appropriate for a stem and leaf plot because it has a large range of data.

- The data in B has a small range so we would use a line plot for that set of data.

***Construct a Stem and Leaf plot with this data.

Candy Bars Sold in Each Class

1	9
2	2
3	3 , 4
4	5
5	9 , 9
6	5 , 8
7	8 , 8

Key: 4 | 5 = 45

What is the mode, median, and range of this data?

Mode: 78 and 59

Median : 59

Range: 78 - 19 =